State of Missouri
Department of Natural Resources
Air Pollution Control Program

INSTRUCTIONS FOR APPLICATION

GENERAL AIR QUALITY OPERATING PERMIT

DRY FERTILIZER HANDLING INSTALLATION

-- BASIC STATE --

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Who Must Apply for an Operating Permit?

All dry fertilizer handling installations that have the potential to emit, including fugitive sources, more than 15 tons PM_{10} per year must apply for an air operating permit. PM_{10} is defined as particulate matter with an aerodynamic diameter of ten (10) microns or less. Fertilizer dust contains PM_{10}.

In determining applicability of the operating permit program to your installation, you need to know your potential to emit (PTE). Potential to emit is defined as the emission rate of any pollutant at maximum design capacity. Annual potential shall be based on the maximum annual-rated capacity of the installation assuming continuous year-round operation. Federally enforceable permit conditions of the type of materials processed, operating rates, hours of operation or the application of air pollution control equipment shall be used in determining the annual potential. MDNR issued construction permits are federally enforceable and restrictions in these permits must be used to limit your potential to emit.

Example: many MDNR issued *de minimis* construction permits limit installation wide PM_{10} emissions to less than 15 tons. In this case, no operating permit is required. However, if a construction permit condition limits PM_{10} emissions to less than 100 tons, then you must apply for a basic state operating permit. Caveat: some construction permit may only limit emissions or tons of materials processed/handled for specific emission points and not for the entire installation. In this case, the construction permit limitation may only be used for the specific portion of the installation covered thereunder when calculating potential to emit.

The definition of regulated air pollutants under the operating permit program applies only to emissions of PM_{10} (particulate matter with an aerodynamic diameter of less that 10 microns) and not to TSP (total suspended particulate). Therefore potential to emit is based on PM_{10} emissions. Fugitive PM_{10} emissions, defined as those which cannot not reasonably pass through a stack or vent, are <u>not</u> required to be counted in determining Part 70 (Title V) operating permit applicability. However, if the source is within one of the 26 named source categories (10 CSR 10-6.020(3)(B)), or is in a source category regulated by New Source Performance Standards (NSPS) or National Emission Standards for Hazardous Air Pollutants (NESHAPs) requirement that underwent special rule making relating to counting fugitive emissions, then fugitive emissions must be counted. In general if the fugitive emissions occur within a building, they must be counted.

What dry fertilizer handling installations qualify for a "Basic State" air operating permit?

Dry fertilizer handling installations with a potential to emit, excluding fugitive sources, less than 100 tons PM_{10} per year qualify for a basic state operating permit. Installations with a potential to emit greater than 100 tons PM_{10} per year must apply for either an Intermediate or a Part 70 (Title V) air operating permit.

How Do I Calculate My Potential to Emit?

If you have previously submitted to the MDNR an Emissions Inventory Questionnaire (EIQ), then you have already identified your PM_{10} emission points. If not, you must identify these points. Common emission points are:

- Truck/Rail Receiving
- Transfer
- Bin Filling
- Transfer to Weigh Hopper
- Transfer to Mixer
- Hand Adds
- Truck/Cart Loadout
- Haul Road (Fugitive Source)

The following are four different configurations of commonly encountered fertilizer installations and their corresponding emission points:

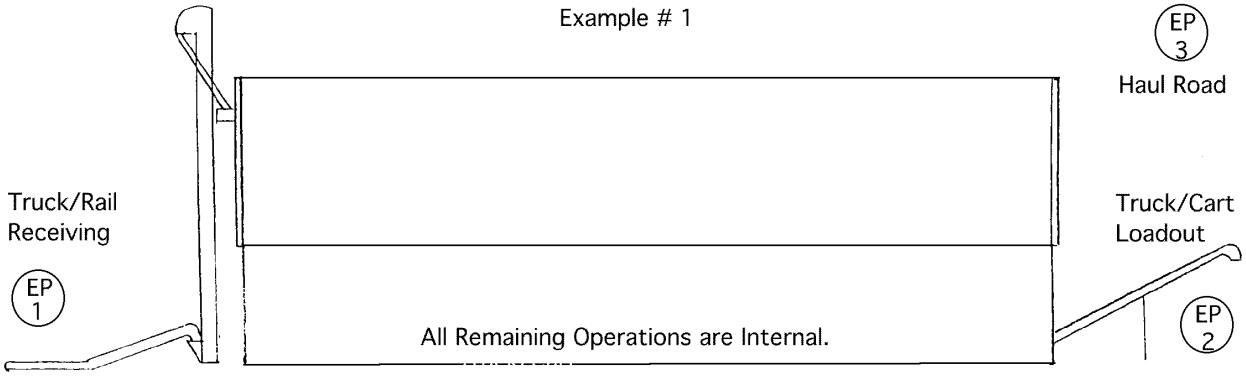
EXAMPLE #1 (See drawing of Example 1 below)

This is a typical installation found around the state. Fertilizer is received by truck or rail and conveyed by either a belt/chain conveyor to a bucket elevator where it is discharged into an overhead auger system inside the building where it drops product into the different storage bays. This is also achieved by discharge pipes from the bucket elevator in some cases instead of the auger.

Truck/Rail Receiving = Emission point #1. The remainder of the process is enclosed or an internal operation.

Truck/Cart Loadout = Emission point #2. The blended product is discharged by a belt conveyor to waiting trucks/carts. The weighing and blending is conducted inside the plant.

Haul Road = Emission point #3. Unpaved roads used to transport dry fertilizer to and from the dry fertilizer handling installation.



EXAMPLE #2 (See drawing of Example 2 below)

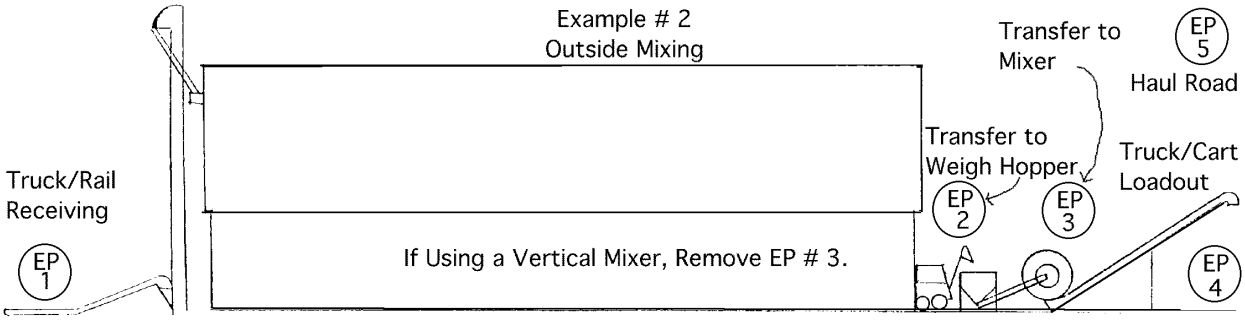
This is a typical installation found especially in the southern portion of the state. Fertilizer is received by truck or rail and conveyed by either a belt/chain conveyor to a bucket elevator where it is discharged into an overhead auger system inside the building where it drops product into the different storage bays. This is also achieved by discharge pipes from the bucket elevator in some cases instead of the auger. The weighing and blending are then conducted outside, sometimes under roof but not enclosed.

Truck/Rail Receiving = Emission point #1. The remainder of the process is enclosed or an internal operation.

Transfer to weigh Hopper = Emission point #2 occurs as the bucket loader drops product into the weigh hopper.

Transfer to Mixer = Emission point #3. After weighing, the product is carried by belt conveyor and discharged into the drum mixer for blending. If the installation has a vertical blender this point can be omitted.

Truck/Cart Loadout = Emission point #4. The blended product is discharged by a belt conveyor to waiting trucks/carts.



EXAMPLE #3 (See drawing of Example 3 below)

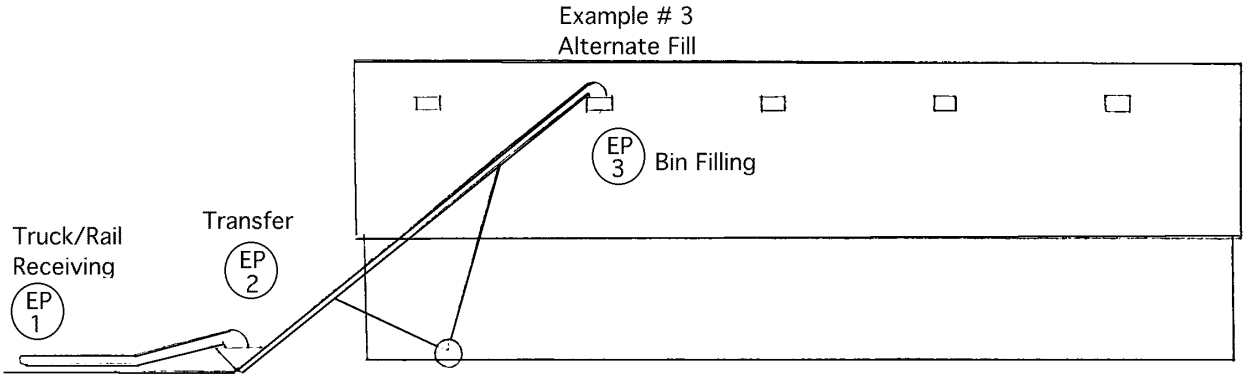
The variation on this is only in the receiving system. Some facilities use a tube belt conveyor to fill the building through roof hatches. This conveyor is supplied by a belt/chain conveyor from under the trucks/railcars.

Truck/Rail Receiving = Emission point #1.

Transfer = Emission point #2 would occur as product is discharged from the truck/rail conveyor to the tube belt conveyor.

Bin Filling = Emission point #3 occurs as product is discharged into the building through the roof. Because these roof hatches are located directly over the storage area, and they are emission points.

The remainder of the operation can be as given in examples 1 & 2.



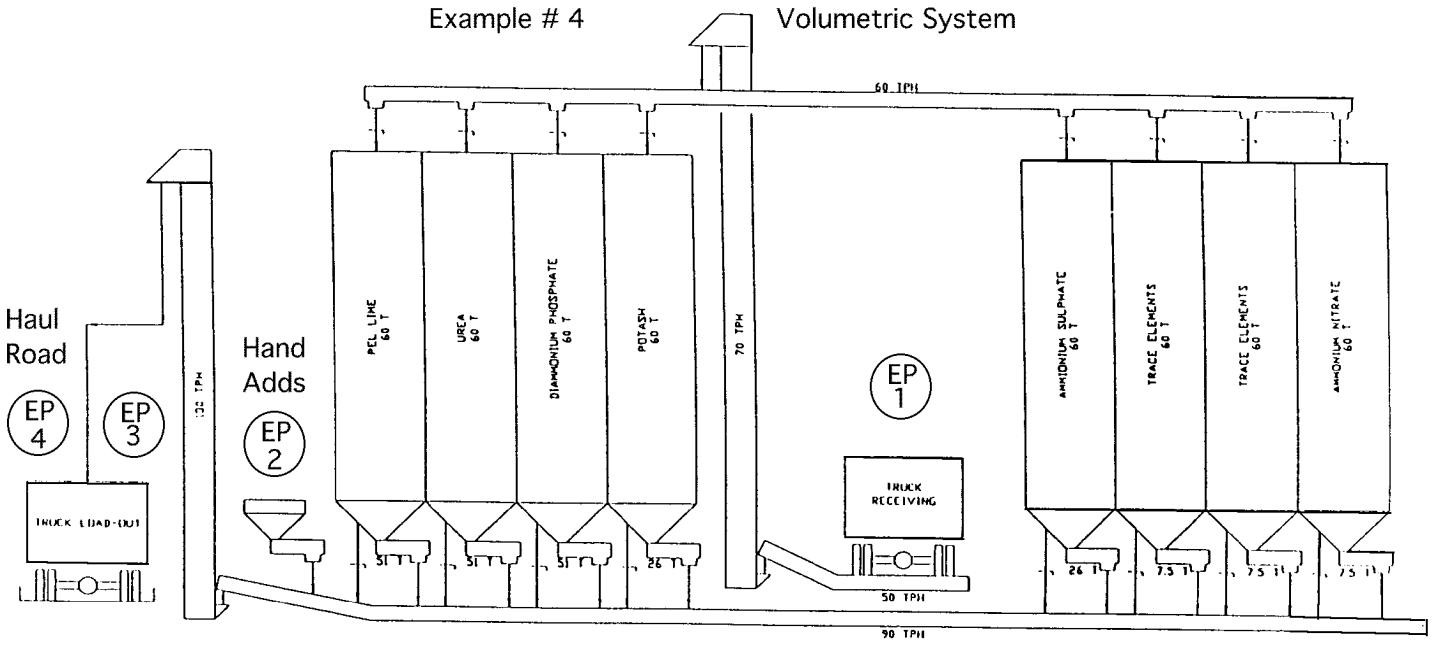
EXAMPLE #4 (See drawing of Example 4 below)

This is a volumetric weigh system which we are using in some instances. The system consists of vertical storage tanks with programmable augers that feed a return auger system. This system then discharges to a bucket elevator that discharges the blended product to trucks/carts.

Truck/Rail Receiving = Emission point #1 is where the product is discharged to a belt/chain conveyor that discharges to a bucket elevator that discharges to an overhead auger that fills the different bins. These are all enclosed systems.

Hand Adds = Emission point #2 is where micro nutrients or seed can be added to the system.

Truck/Cart Loadout = Emission point #3 is where the blended product is discharged from the bucket elevator to trucks/carts.



What Other Information Must I Have to Calculate My Potential to Emit?

You must know the "maximum hourly design rate" (MHDR) in tons per hour for each emission point? For example, you need to know how fast trucks or rail cars can unload. You must also know the rated capacity for conveyers, bucket loaders, mixers and loadout in tons per hour. The only emission factor applicable to fertilizer installations is 0.02 pounds per ton handled or processed. If you have haul roads you need to calculate the MHDR and PM_{10} emission factor for the haul road using the following formulae:

$$MHDR\,(VMT) = \frac{[\,2\times(Length\ of\ Haul\ Road)\times(Annual\ Amount\ Hauled)\,]}{[\,(Average Weight\ of\ Material\ per\ Load)\times(Total\ Annual\ Hours\ of\ Operation)\,]}$$

$$EF = k(5.9)\left[\frac{s}{12}\right]\left[\frac{S}{30}\right]\left[\frac{W}{3}\right]^{0.7}\left[\frac{w}{4}\right]^{0.5}\left[\frac{365-p}{365}\right]$$

Where:

VMT = vehicle miles traveled
EF = emission factor, lb/VMT
k = particle size multiplier for PM_{10} = 0.36
s = silt content of road surface material, (%)
S = mean vehicle speed, (miles per hour)
W = mean vehicle weight, (ton)
w = mean number of wheels
P = number of days with at least 0.01' of precipitation per year

If you have bottlenecks in your fertilizer handling process, take advantage of them to lower your installation's potential to emit. For example, a conveyor may have a MHDR lower than the "downstream" emission points. If such is the case, you may apply the conveyor's lower MHDR to all downstream emission points even if their independent MHDR is higher.

What Control Devices May Apply to My Emission Points?

Unlike grain elevators, dry fertilizer facilities rarely if ever use bag houses or cyclones to reduce PM_{10} emissions. Most emission points do not have any control device. Instead, the most commonly recognized control device is building enclosures around the emission point. The chart below lists control factors recognized by the MDNR.

TABLE 1 - CONTROL DEVICES AND CONTROL FACTORS (CF's)	
No Control	1
Full Enclosure	0.1
3-Sided Enclosure	0.3
2-Sided Enclosure	0.5
Baffling	0.791
Haul Road Watering	0.5

In the case of two applicable CF's calculate the Combined CF as follows:

Combined CF = CF1 X CF2.

Each CF = 1.00 - (Control Efficiency in %)/100.

Note: Structures which surround a process can be considered enclosures. This includes buildings and sheds.

Sample Potential to Emit Calculation

The chart below is an example on how to calculate the potential to emit of the simple fertilizer plant depicted in Example 1.

Emission Points (Units)	MHDR (Tons/Hr)		Emission. Factor (lb\ton)		Hours of Operation		Control Factor	Divide by 2,000 lbs.		PTE (TPY)
Truck/Rail Receiving	120	x	0.02	x	8,760	x	1	÷ 2,000	=	10.51
Truck/Cart Loadout	120	x	0.02	x	8,760	x	1	÷ 2,000	=	10.51
Haul Road*	VMT		Lb/VMT							
	0.91	x	1.31	x	8,760	x	1	÷ 2,000	=	5.22
								Total	=	26.24

*Assume: Annual amount hauled 50,000 tons fertilizer; 0.25 mile unpaved road; 1820 hours of operation, number of wheels is 10; unloaded truck weight is 15 tons; average loaded truck weight is 30 tons; use default value of 9.6 for silt content and 105 for days of rain.

MHDR = 2 x [0.25 x 50,000] ÷ [15 x 1825] = 0.91 VMT

EF = $0.36(5.9)(9.6/12)(5/30)[\{(30+15)/2\}/3]^{0.7}\,[10/4]^{0.5}\,[(365-105)/365]$ = 1.31 lbs/VMT

Blank Chart for You to Calculate Your Potential to Emit

Now, it is your turn to calculate your potential to emit. If you have more than one emission point for each category below, simply write each additional emission point in the blank lines provided at the bottom of the chart. Otherwise, ignore emission points listed below that do not exist at your installation.

Emission Points (Units)	MHDR (Tons\Hr)		Emission. Factor (lb\ton)		Hours of Operation		Control Factor	Divide by 2,000 lbs.		PTE (TPY)
Truck/Rail Receiving		x	0.02	x	8,760	x		÷ 2,000	=	
Transfer		x	0.02	x	8,760	x		÷ 2,000	=	
Bin Filling		x		x	8,760				=	
Transfer to Weigh Hopper		x	0.02	x	8,760	x		÷ 2,000	=	
Transfer to Mixer		x	0.02	x	8,760	x		÷ 2,000	=	
Hand Adds		x	0.02	x	8,760	x		÷ 2,000	=	
Truck/Cart Loadout		x	0.02	x	8,760	x		÷ 2,000	=	
Haul Road	VMT		lb/VMT							
		x		x	8,760	x		÷ 2,000	=	
								Total	=	

QUALIFIED APPLICANTS

Dry fertilizer handling installations with a potential to emit less than 100 tons per year of PM_{10} are eligible to obtain an operating permit under Missouri State Rule 10 CSR 10-6.065(4), Basic State Operating Permits by submitting a competed General Permit and Application.

All Permit/Applications must meet the following requirements:

1. Submit duplicate copies of the Permit/Application.
2. Submit $100.00 application fee.
3. All signatures must be signed in ink.
4. When required, provide a completed Emission Inventory Questionnaire (EIQ).

Permit/Applications are incomplete unless all information requested is supplied. Failure to supply any additional information requested by the permitting authority may result in the denial of the Permit/Application.

If you need assistance or have further questions, Contact:

- Mo. Dept. of Natural Resources
  Air Pollution Control Program
  Operating Permit Unit
  P.O. Box 176
  Jefferson City, MO 65102-0176
  Telephone: (573) 751-4817
  Fax: (573) 751-2706
- Mo. Dept. of Natural Resources
  Regional Offices
- Technical Assistance Program (TAP)
  Telephone: (800) 361-4827
- The appropriate local agency

Completed applications must be mailed to the above address (do not fax application). However, if the installation for which you are submitting an operating permit application is located in the cities of Kansas City, Springfield or St. Louis, or the county of St. Louis, you will submit your operating permit application to the respective local agency.

Local Agency Addresses:

Kansas City
Kansas City Health Dept.
Air Quality Section
2400 Troost Avenue, Suite 300
Kansas City, MO 64108
Telephone: (816) 983-4301
Fax: (816) 983-4475

St. Louis County
St. Louis County Dept. Of Health
Air, Land & Water Branch
Air Pollution Control section
111 South Meramec
Clayton, MO 63105
Telephone: (314) 854-6923
Fax: (816) 274-2503

Springfield-Green County
Air Pollution Control Authority
227 East Chestnut Expressway
Springfield, MO 65802
Telephone: (417) 864-1662
Fax: (417) 864-1499

City of St. Louis
Div. Of Air Pollution Control
1220 Carr Lane Ave.
St. Louis, MO 63104
Telephone: (314) 664-7877
Fax: (314) 664-7933

ACRONYMS AND ABBREVIATIONS

CSR = Code of State Regulations
DNR = Department of Natural Resources
EIQ = Emissions Inventory Questionnaire
EPA = Environmental Protection Agency
ER = emission rate
LBS/HR = pounds per hour
MHDR = maximum hourly design rate
MDNR = Missouri Department of Natural Resources
PM = particulate matter
PM_{10} = particulate matter less than or equal to 10 microns in aerodynamic diameter
Tons/HR = tons per hour
Tons/YR = tons per year
TPY = tons per year

APPLICATION DEADLINE

Basic State Installation must file an application no later than May 13, 1998.

Section I - GENERAL INFORMATION

You will find most of this information on Form 1.0 of your most recently completed EIQ.

Section II - EMISSION INVENTORY

If your installation has not previously submitted the annually required Emission Inventory Questionnaire Forms, you need to obtain these forms and submit them with this application. Otherwise, you do not need to submit these forms. Amendments or changes to a previously submitted EIQ must be submitted at the same time as the general operating permit application. The additional EIQ forms must clearly state that they are replacement or additional forms.

Section III - EXISTING PERMIT CONDITIONS

Table A requires the applicant to list all existing particulate control devices built pursuant to an air construction permit issued by the MDNR. It is rare for a fertilizer installation to have control devices. Generally speaking, bag houses are not used with fertilizer because the bags quickly become coated with the fertilizer dust rendering the bags useless, and cyclones corrode at a high rate.

Table B requires the applicant to list all receiving and processing limits listed in air construction permit issued by the MDNR. As mentioned earlier in these instructions, if you have an installation wide emission limit of less than 15 tons PM_{10} per year, then you are exempt form the air operating permit requirement. If not, the most common PM_{10} emissions limit from receiving, processing or handling would be 100 tons per year.

Section IV - COMPLIANCE STATEMENT

The wording in the Compliance Statement is self-explanatory.

Section V – APPLICANT'S CERTIFICATION STATEMENT

A responsible official must sign the document certification. The responsible company official is required to certify to the truth, accuracy, and completeness of the document. The certification must state that:

> "Based on information formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete" (emphasis added).

The definition of responsible company official means, for most facilities, that the certification statement must be made by the plant manager or a more senior corporate official. In fact, at some locations, the plant manager can only make the certification if delegation of authority to the plant manager is approved in advance by the permitting authority. Eligible parties to make the certification include:

- a corporate officer
- a person in charge of a principal business function (e.g., a general manager), or
- a person in charge of a principal business function (e.g., a general manager), or
- a plant manager, provided that the plant has at least 250 employees or $25 million in sales or expenditures (in 1980 dollars) or authority has been delegated.

Knowingly falsifying any document, representation, or certification is a felony under the Clean Air Act; therefore, responsible company officials must take care in preparing the certification, and must ask the proper questions to ensure the accuracy and completeness of the document.

Section VI - GENERAL PERMIT

Go through the General Permit thoroughly and check the "Not Applicable" box in all sections (6.01 through 8.03) that do not apply to your installation. Be sure to check "not applicable" for those rules that do not apply to your area. All Missouri State Rules for your area are applicable.

Please note that in many cases the "Record Keeping Requirement" for many applicable requirements is the maintenance of previous DNR inspection reports.